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PLUGGING PRODUCT FOR HILL RESERVOIRS, EMBANKMENTS, AND LAGOONS.

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The invention relates to a product allowing one to plug leaks in water reservoirs in a very short time, without emptying, without special equipment, and at low concentration.

It consists of a mixture of two high molecular weight polyacrylamides: a flocculent polyacrylamide which has plugging and gelling qualities after hydration; a water-retaining crosslinked polyacrylamide with a coarse-grained appearance with the consistency of foam rubber, after hydration.

Hydration at the bottom of the reservoir causes the formation of a continuous layer of gel (flocculent

polyacrylamide) in which the water-retaining polyacrylamide grains are embedded: which brings about plugging.

The product of this invention is particularly intended for plugging leaks in hill reservoirs, embankments, lagoons, and dikes.

The present invention relates to a mixture of chemical products intended for plugging leaks in water reservoirs [and] which is nontoxic to the aquatic flora and fauna.

Plugging these water leaks is currently done by destroying all or part of the embankment in order to reconstruct it as well as possible, by spreading a large quantity ($5-20 \text{ kg/m}^2$) of swelling clay, by injection of cement or resin, or by laying a sheet of plastic.

In the majority of cases, the expenses involved are extensive; the operation requires emptying of the reservoir and the involvement of public works machines.

The product of this invention makes it possible to remedy these disadvantages. It is used in small amounts (50 g/m^2), does not require emptying of the reservoir, and is spread by hand by the user.

It is present in the form of grains of more than 0.8 mm so as to be retained on the surface by the forces of surface tension.

The product of this invention consists of a mixture of two polymers:

- A high molecular weight polyacrylamide that forms a sticky and viscous layer after hydration (this product is used as flocculator for wastewater in a purification station).
- A high molecular weight crosslinked polyacrylamide that forms small irregular cubes, 1-3 cm on a side, after hydration, with the consistency of foam rubber. (This product is used as water retainer).

The crosslinked polyacrylamide is used in a proportion lower than 40% in the mixture.

The two polyacrylamides are chosen so as to be capable of absorbing 100-200 times (one hundred to two hundred times) their weight in fresh water. The weight of the transported dry plugging agent then represents less than 1% of the plugging agent in place after hydration.

The main action of the product of this invention is the following: The crosslinked polyacrylamide is embedded in a sticky layer of flocculent polyacrylamide after hydration.

The presence of a crack causes, by loss of water, a "pumping" of the sticky layer, which carries the cubes of crosslinked polyacrylamide. This suction continues until an accumulation of cubes of sufficient dimensions blocks the crack. The product continues to be hydrated there in order to ensure definitive plugging.

The flocculent polyacrylamide is enough to limit the water losses because of [its] porosity.

The polyacrylamides have little or no biodegradability in the absence of light. Their low sensitivity to several

hydration/dehydration cycles (followed by spring emptying of the reservoirs in order to used their water) allows the plug to be preserved for several years.

The appended drawings illustrate the invention:

Figure 1 represents, in section, the falling of the grains of the product on the bottom of the reservoir.

Figure 2 represents, in section, the end of hydration of the product and the beginning of the plugging of the cracks, (1) being the flocculent polymer transformed into a sticky layer after hydration, (2) being the crosslinked polyacrylamide transformed into irregular cubes after hydration.

The product of this invention is particularly intended for plugging leaks in hill reservoirs, embankments, lagoons, and dikes.

Claims

1. A product for plugging leaks in water reservoirs, characterized by the combination of a plugging agent which gels after hydration and a plugging agent that becomes granular after hydration.

2. A product according to Claim (1), characterized by the great capacity to absorb water of the constituents, which consequently increase in volume.

3. A product according to Claim (2), characterized by the small quantity of transported dry product with respect to the final volume of the plugging agents formed after hydration: ratio of 1% minimum.

4. A product according to Claim (2) and Claim (3), characterized by its capacity to use the water of the reservoir for its hydration and swelling.

5. A product according to Claim (1), characterized by its grain size higher than 0.8 mm when dry.

6. A product according to Claim (1), characterized by the presence of a flocculent polyacrylamide and a water-retaining crosslinked polyacrylamide.

7. A product according to Claim (6), characterized by a proportion of crosslinked polyacrylamide lower than 40 wt%.

8. A product according to Claim (6), characterized by the use of constituents which, after hydration, are not toxic and do not offer a favorable medium for bacterial development.

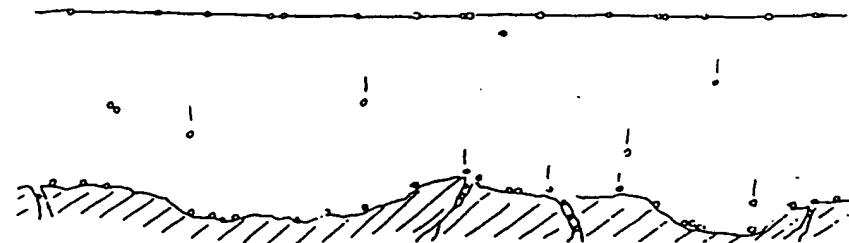


FIG. 1

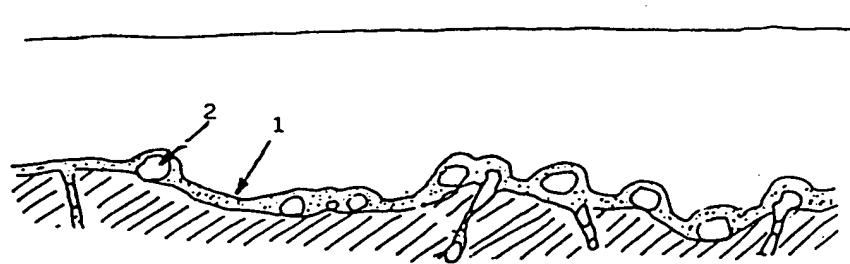


FIG 2